

Reply

Applicants thank the Examiner for the very thorough consideration given the present application. Responsive to the Final Rejection dated July 10, 2007, Applicants filed a Request for Reconsideration and Amendment after Final. The Amendment emphasized the feature of the invention in which the gas supply system controller supplies a cleaning gas and then subsequently supplies post-processing gases for removing the undesirable elements remaining from the cleaning gases by alternately supplying each of the reaction gases from their exclusive supply nozzles. Responsive thereto, the Examiner withdrew the Final Rejection and issued a new Office Action adding a new reference to the previously applied prior art, presumably to address this feature which was previously in claim 2.

By this reply, Applicants express their appreciation for the Examiner's willingness to review Applicants' arguments, amendment and the prior art. Applicants believe that this process has indeed crystallized a central issue in this application, and hopefully will result in an expeditious and favorable disposal.

Claims 1 and 3-15 are now present in the application. Claims 1 and 8 are independent. Claims 11-15 have been withdrawn by the Examiner as directed to a non-elected invention. Reconsideration of this application, as amended, is respectfully requested. Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

Rejections under 35 U.S.C. § 103

Claims 1, 3-6 and 8-10 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Publication No. 2002/0073923 to Saito et al. ("Saito") in view of U.S. Publication No. 2004/0008336 to Lam et al. ("Lam") and U.S. Publication No. 2001/0029891 to Oh et al. ("Oh"). Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness and respectfully traverse the rejection.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the cited references must teach or suggest each and every element in the claims. *See M.P.E.P. § 706.02(j); M.P.E.P. § 2141-2144.*

Independent claims 1 and 8 recite a substrate processing apparatus wherein the controller controls the post-processing gas supply unit to supply each of the reaction gases alternately from the exclusive supply nozzles. Neither Saito nor Lam, alone or in combination, suggest this feature. Moreover, the newly cited reference to Oh also fails to suggest this feature. Therefore, Applicants submit that claims 1 and 8, and the claims dependent thereon, are patentable over Saito in view of Lam and Oh. Therefore, it is respectfully submitted that the rejection under 35 U.S.C. § 103(a) does not teach or suggest each and every element of the claim and therefore should be withdrawn.

More specifically, claims 1 and 8 require a gas supply system controller that supplies a cleaning gas and then subsequently supplies post-processing gases for removing the undesirable elements remaining from the cleaning gases by alternately supplying each of the reaction gases from their exclusive supply nozzles. Saito and Lam have been discussed at length before, such as in the response filed January 9, 2008, which is incorporated herein. The Examiner now indicates in the instant Office Action that Oh has been cited and applied to show this feature. Oh shows an atomic layer deposition (ALD) apparatus and process wherein very thin film layers (one atom thick) may be deposited by alternate application of an activated first material gas and a non-activated second material gas. The Examiner points to paragraph [0080] of the reference in the Office Action on page 5 in support of the motivation for alternately applying each of the post-processing gas supply units. A careful review of Oh reveals that it is alternately applying the deposition gases, not the post cleaning gases. Oh indicates in paragraph [0074] that it is possible to perform a cleaning step by introducing SF₆, which could correspond to the instant claimed cleaning gas, and the cleaning gas HF for the cleaning step in Saito, see paragraphs [0148]-[0151]. But Oh does not even disclose a step after the cleaning process to remove cleaning process contaminants that result from cleaning, much less teach that such an additional

step would include reaction gases alternately supplied. Therefore, it is submitted that a teaching relating to the alternate application of film forming gases in an ALD apparatus does not reasonably suggest that alternate application of chemical vapor deposition CVD reaction gases would serve to remove contaminants left from a cleaning gas. Moreover, Saito is directed to chemical vapor deposition processes where the reactant deposition gases must be mixed in order to achieve the reaction necessary to form the desired layer. It would appear that any attempt to alternately supply the reaction gases in Saito would destroy the CVD process. Finally, it is submitted that the only suggestion in the record, that alternate application of reaction gases would solve the problem of leftover cleaning residue of HF cleaning gas, comes from Applicants' own disclosure. Reliance upon Applicants' own disclosure would, of course, be inappropriate.

Claim 3 requires that each of the reaction gases supplied from the post-processing gas supply unit removes the element remaining in said exclusive supply nozzles and said reaction container, and the reaction gases form a desired film in said reaction container.

The Examiner refers to paragraphs 0093, 0094, 0095 and 0097 of Saito for a teaching of these features. To the contrary, it is respectfully submitted that Saito fails to disclose that each of the reaction gases supplied from the post-processing gas supply unit removes the element remaining in said exclusive supply nozzles and said reaction container, and the reaction gases form a desired film in said container. Therefore, for this reason as well as the reason noted above with respect to claim 1, it is submitted that claim 3 is patentable over Saito in view of Lam and Oh. Claims 4-6 depend from claim 3, and it is submitted that these claims are also patentable at least for the same reasons as claims 1 and 3.

Independent claim 8 recites a control apparatus for controlling the substrate processing apparatus such that cleaning gas is supplied from one of the supply nozzles into said reaction container at the time of cleaning, and all reaction gases used for processing a substrate are alternately supplied into said reaction container from the exclusive supply nozzles.

Neither Saito nor Lam nor Oh, alone or in combination, suggest a control apparatus for controlling the substrate processing apparatus such that cleaning gas is supplied from one of the supply nozzles into said reaction container at the time of cleaning, and all reaction gases used for processing a substrate are alternately supplied into said reaction container from the exclusive supply nozzles. Therefore, for this reason it is submitted that claim 8 is patentable over Saito in view of Lam and Oh.

The additionally applied art to Choi et al. (U.S. Patent No. 6,279,503) fails to show or suggest any of the missing features discussed above and therefore cannot remedy the failure to teach such features with respect to claims 1, 3 and 8.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Every possible effort has been made to clearly delineate the distinctions between the applied prior art and the present invention in an effort to conclude prosecution with allowance of the application. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

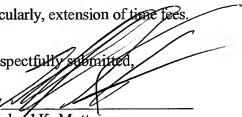
Prompt and favorable consideration of this Amendment is respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Paul T. Sewell, Reg. No. 61,784 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

Dated: April 30, 2008

Respectfully submitted,

By 
Michael K. Mutter
Registration No.: 29,680
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicants